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The San Andreas Fault System comprises thousands of faults accommodating transform movement between the Pacific and North American plates.

USGS

Numerous major faults, including the San Andreas Fault, slice through the Bay Area.

The San Andreas Fault

The Pacific and North American Plates do not always glide smoothly past each other. The movements are often erratic, jerky and sudden. We call these movements earthquakes. Although currents of magma below each plate power them, friction between the rocks along the fault prevents the plates from moving. This friction causes stress to build up along the San Andreas Fault, bending and deforming the rocks within as they store potential energy as in a stretched rubber band. When the rocks can no longer resist the strain, they fracture suddenly, releasing decades of accumulated energy in a few seconds. Moments like these dramatically alter landscapes.

Millions of Years of Motion

The cumulative effect of countless earthquakes and gradual plate movement along the San Andreas Fault over the past 16 million years has shaped the land around it. The Point Reyes peninsula has traveled over 100 miles along the fault from near Monterey. Movement along the fault sculpts the long, parallel ridgelines defining the Olema Valley. Within this valley, plate movement molds shutter ridges, small hills along the fault formed as a result of local compression and uplift, and sag ponds, basins created by the downdropping of earth as land stretches apart. These features occur elsewhere in California along the San Andreas Fault marking its path and connecting Point Reyes to other areas in the state with a shared geologic history.

A Community of Faults

The San Andreas Fault is part of a large community of faults along the tectonic boundary; one of hundreds of faults in the Bay Area alone and among thousands of others along its length. The San Andreas Fault System, the broad collection of faults between the Pacific and North American plates, accommodates overall transform movement between them. Each fault within the system helps shape the land we see today. The fault system itself also undergoes transformation. Individual faults lock up and new ones rupture. Some scientists speculate that transform movement between the plates will abandon the San Andreas and concentrate along faults east of the Sierra ripping California from North America.

Our Everchanging World

The tectonic boundary divides and shapes the landscape along the San Andreas Fault, but tectonic activity shapes our entire planet. Throughout the world, circulating magma energizes tectonic boundaries that mold land into mountains, volcanoes, valleys and hills. Although tectonic boundaries may divide plates, they unite areas around the earth in a shared global geologic heritage.

Log On for More Information about Plate Tectonics and Earthquake Science

National Park Service:
www2.nature.nps.gov/geology/tour/
U.S. Geological Survey:
www.quake.usgs.gov
UCSB Geology Department:
http://emvc.geol.ucsb.edu/
Bancroft Library:
http://bancroft.berkeley.edu/collections/earthquakeandfire/
San Francisco Museum:
www.sfmuseum.org
Public Broadcasting System:
www.pbs.org/wgbh/aso/tryit/tectonics/
Association of Bay Area Governments:
http://www.abag.ca.gov/bayarea/eqmaps/

National Park Service
U.S. Department of the Interior

Point Reyes National Seashore

Chief of Interpretation
John Dell'Osso
415.464.5135

Contributers
Douglas Hee
Melinda Repko
John Golda
Loretta Farley
Steve Anastasia
Mary Beth Shenton

Mailing Address
1 Bear Valley Road
Point Reyes, CA 94956

E-mail
www.nps.gov/pore

Fax Number
415.663.8132

Park Headquarters
415.464.5100

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